PATENT CLAIMS

1. A superconducting resistive current limiter adapted for a nominal voltage U_N and carrying a nominal current I_N at a working temperature T_N, with at least one track (1) of length L_{tot} comprising a thin-film of high-temperature superconducting material with a critical current density J_C and an electrical bypass layer in contact with the film, wherein the track (1) consists of a multitude of constrictions (2) having a total length L_C and each having an approximately constant critical current $I_{C,C}$ equal to the nominal current I_N and being separated from each other by connecting sections (3) having a critical current $I_{C,S}$ larger than I_N,
characterized in that the total resistance R_C of the constrictions (2) at working temperature T_N is adapted to cause a voltage drop equal to the nominal voltage U_N at an initial fault current I_b limited to a value below a prospective fault current.

2. The current limiter according to claim 1, characterized in that the resistance R_C of the constrictions (2) at an initial fault current I_b with a current density J_b of approximately 1.5 times J_C flowing in the constrictions (2) is adapted to cause a voltage drop $U_C = R_C$ times I_b equal to the nominal voltage U_N.

3. The current limiter according to claim 2, characterized in that an averaged reduced resistivity ρ_C of the constrictions (2) at working temperature T_N and at the initial fault current density J_b is adapted to limit the surface power density p_b dissipated by the constrictions (2).

4. The current limiter according to claim 3, characterized in that the averaged reduced resistivity ρ_C of the constrictions (2) is given by $\rho_C = p_b / J_b^2 \cdot e$, wherein e is the thickness of the superconducting film at the constrictions.

5. The current limiter according to claim 4, characterized in that the conductivity of the bypass layer is higher along the constrictions (2) than along the connecting sections (3).

6. The current limiter according to one of claims 1 to 4, characterized in that the constrictions (2) are divided into two or more paths (20) electrically connected in parallel.